Key to Plant Subformations of the Rocky Mountain Region

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Instructions

a. This key is for use in classifying a site to the Plant Subformation level.

b. A site is the smallest map delineation that is homogeneous for Forest Service management at the project level, usually mappable and visible as a polygon at the 1:24,000 scale. Even at that scale, though, there may be major unmappable patches, such as wet spots or cliffs, that the user will need to factor out before beginning the key. Scales smaller than 1:24,000 will be much less useable. Often, map delineations of Plant Subformations are only visible at that scale or larger.

c. Please remember that Plant Subformations are potential (climax) plant communities. If the site being classified is not at potential, the user must project the site backward or forward in time to estimate what the potential (climax) dominants of the site will be (or was). The concepts of shade-tolerance (forestry) and increaser-decreaser (range management) will be useful in making that projection. In this key, "dominant" means "dominant at potential." A dominant species usually has the largest canopy cover in one of the tallest layers.

d. This is a key to potential plant communities; not to landforms, soils, climates, geology, water, or other components of Ecological Types. Abiotic descriptors are used in these keys for their indicator value as regards potential plant communities, and an ecological classification is not implied by their use.

e. This is an artifical key, which means that it will not follow the same order as the classification. Plant communities grouped together in the key are different from those grouped together in the classification.

f. In order to save space, the word "or" throughout this key should be taken to be all-inclus- ive. In other words, "or" means "or, and/or, one-several-all of the above."

g. The classification has been modified somewhat from the classification in The Plant Associations of Region Two, Edition 4, Appendix 5 (1987).

KEY

1. Site is in the alpine zone (belt), clearly above timberline, not dominated by tall woody vegetation. No forests nor woodlands; few shrublands and these short to very short .....(3)
1. Site at or below the alpine timberline, dominated by woody vegetation or not .....(2)

2. Riparian areas, with free unbound water or high water table through most of the growing season; dominated by cottonwoods, green ash, American elm, hop–hornbeam, blue spruce, shrub willows, Rocky Mountain maple, thinleaf alder, birches, redosier dogwood, beaked hazel, bearberry honeysuckle, tufted hairgrass, wet-site sedges, bluejoint reedgrass, cattails, reed, horsetails, marsh-marigold, arrowleaf groundsel, or mountain bluebells. Spruce or subalpine fir forests are dominated by water-loving plants from the above list in the undergrowth .....(8)
2. Upland areas, not riparian or wetlands; water table is high only a fraction of the growing season; usually all of the plants on the above list are absent. Spruce or subalpine fir forests have none of the above plants in the undergrowth .....(29)

I. ALPINE, ABOVE TIMBERLINE

3. Protected sites (protected primarily from wind) with significant snow deposition but melting early in growing season, vegetation dominated by grasslike plants: kobresia or sedge species, less commonly grasses .....**25. Alpine Grasslands**
3. Sites either blowing free if snow in winter or else with snow lying at least past the first third of the season, vegetation commonly dominated by forbs, less commonly graminoids or low shrubs .....(4)

4. Shrub (willow-birch) carrs apparently in lower alpine (actually upper subalpine), shrub layer averaging 1-2 m tall, dominated by grayleaf, planeleaf, barrenground, or Wolf willows or bog birch, usually large (for alpine) riparian areas .....(24)
4. Vegetation dominated by herbaceous plants, less commonly low shrubs, if riparian very narrow and with no shrubs .....(5)

5. Alpine areas in very protected areas with late-melting snowbanks, water produced throughout growing season on site or just above it, vegetation nearly all forbs and mosses, grasses inconspicuous; fine-textured soils .....**27. Bog-Marsh Forblands & Late Snowmelt Areas**
5. Alpine areas blowing free of snow early in season or throughout winter, vegetation forbs or sometimes sedge- or rush-dominated; coarse- or fine-textured soils .....(6)

6. Sides and tops of wind-exposed ridges, stabilized slopes slowly moving (solifluction), vegetation in mat–cushion form, dominated by dryas or alpine nailwort .....**26A. Mats**
6. More protected sites, fellfields and moderately–protected ridges, mat-cushion plants minor or absent, vegetation dominated by sedges or forbs, especially several clover species .....(7)

7. Fine-textured soils but with coarse fragments (cobbles to much larger) at or near surface on fellfields or ridges, dominated by sedges and forbs such as various alpine clovers, alpine avens absent .....**26B. Fellfields and Ridges**

7. Coarse textured soils without significant coarse fragments, lower ridges and more protected sites, domined by alpine avens, forb willows, or rarely Parry clover .....**26C. Ridges and Protected Sites with Coarse Soils**

II. RIPARIAN AREAS BELOW THE ALPINE

8. Dominated by deciduous trees, such as cottonwoods, elm, ash, hop-hornbeam, or rarely tree willows. Plains or foothills .....(9)
8. Dominated by coniferous trees, shrubs, graminoids, or forbs .....(15)

9. Dominated by green ash, plains cottonwood, balsam poplar, American elm, tree willows, or eastern hop–hornbeam, in riparian areas and wooded draws clearly within the northern Great Plains or foothills, from eastern Wyoming eastward and northward .....(10)
9. Dominated by other cottonwoods, aspen, paper birch (tree), or box-elder, or else outside the northern Great Plains .....(12)

10. Dominated at potential by plains cottonwood or balsam poplar, not seral to green ash, American elm, hop–hornbeam, or other trees .....**07A. Plains Cottonwood**
10. Not dominated at potential by plains cottonwood or balsam poplar .....(11)

11. Dominated at potential by tree willows: peachleaf or Bebb willows, in upland draws with high water table part of the season .....**07C. Tree Willows**
11. Dominated at potential by green ash, American elm, or eastern hop-hornbeam .....**07B. Ash-Elm-Maple-Hophornbeam Bottoms**

12. Dominated at potential by aspen, possibly with paper birch (if in the Black Hills) .....(13)
12. Dominated by cottonwoods .....(14)

13. Dominated at potential by aspen, nonriparian sites (rarely small sites with a high water table seasonally), Central and Southern Rocky Mountains .....(49)
13. Dominated by aspen and/or paper birch, riparian or subriparian sites in the Black Hills eastward and northward .....**24C. Oak and Birch Forest**

14. Dominated at potential by narrowleaf cottonwood (with or without blue spruce). Foothills and around the foothills-montane border, both eastern and western slopes .....**24A. Narrowleaf Cottonwood**
14. Dominated at potential by Fremont cottonwood. Clearly within foothills and canyons .....**24B. Canyon Cottonwood and Box-elder**

15. Dominated at potential by wet-site sedges or wet-site grasses. At potential, sites are clearly wetlands with high water-tables and poorly-drained to very poorly-drained soils .....(16)
15. Dominated at potential by shrubs or coniferous trees .....(19)

16. Plains wetlands, sloughs and salt flats .....(17)
16. Sites outside (above) the plains .....(18)

17. Fresh-water wetlands and sloughs, dominated by reed, reedgrass, cat-tails, tules, and rushes. Water usually at or above the surface...**05. Fresh-Water Riparian Grasslands**
17. Salt flats, dominated by saltgrass, western wheatgrass, rushes, alkali grass, sea-blite, or seepweed. Water table usually below the surface .....**06. Salt Flats**

18. Dominated by tufted hairgrass, bluejoint reedgrass, Nebraska sedge, or short-beaked sedge
.....**11A. Tufted Hairgrass and Reedgrass Wet Meadows**
18. Wetlands, dominated by wet-site sedges (beaked, water, woolly sedges) or spike-rushes. Tufted hairgrass and true rushes are subdominant or seral
.....**11B. Sedge Wetlands**

19. Dominated at potential by shrubs, generally without trees except occasional, accidental individuals .....(20)
19. Coniferous trees dominant or at least reproducing sufficiently to replace stand in relatively short time. .(25)

20. Sites of the foothills and plains, dominated by hoary willow, meadow willow, sandbar (coyote) willow, thinleaf alder, or river birch
..... **17A. Foothills and Plains Riparian Shrub**
20. Sites of the montane, subalpine, or alpine zones (belts) .....(21)

21. Sites of the montane belt, dominated by thinleaf alder, Rocky Mountain maple, bearberry honeysuckle, redosier dogwood, or certain willow species (Booth, Drummond, Geyer, Bebb, Pacific, and yellow willows) .....(22)
21. Sites of the subalpine zone (belt) or lower alpine, dominated by thinleaf alder, bog birch, or other willow species (grayleaf, planeleaf, barrenground, and Wolf willows) .....(24)

22. Dominated by thinleaf alder along with various willow species .....**17B. Montane Alder Riparian**
22. Thinleaf alder not dominant nor codominant .....(23)

23. Dominated by maple, redosier dogwood, or bearberry honeysuckle at potential
.....**17C. Maple-Dogwood-Honeysuckle Riparian**
23. Dominated by Booth, Drummond, Geyer, Bebb, Pacific, or yellow willows at potential
.....**17D. Montane Willow Riparian**

24. Dominated by bog birch, with or without thinleaf alder, but not codominated by willows
.....**17E. Subalpine Birch Riparian**
24. Dominated by grayleaf, planeleaf, or Wolf willows
..... **17F. Subalpine Willow Riparian**

25. Riparian forests dominated by blue spruce or white spruce .....(26)
25. Riparian forests dominated by Engelmann spruce or subalpine fir .....(28)

26. Cottonwood codominant with blue spruce .....(14)
26. Cottonwood not present .....(27)

27. Blue spruce dominant in riparian areas, with thinleaf alder, Saskatoon serviceberry, redosier dogwood, or other moisture-loving plants in the undergrowth. Heavily-armored streambanks nearly always present
.....**20G. Blue Spruce Riparian**
27. White spruce dominant in riparian areas of the Northern Rockies and Black Hills, or white-Engelmann spruce hybrid in riparian areas of the Northern Rockies
.....**20H. Engelmann & White Spruce Riparian**

28. Engelmann spruce dominant in riparian or subriparian (moist, slightly upslope from riparian areas or bottoms without a channel) sites, true fir or Douglas-fir absent or isolated individuals. In the Northern Rockies, the spruce may be an Englemann-white spruce hybrid
.....**20H. Engelmann & White Spruce Riparian**
28. Engelmann spruce codominant with subalpine fir, in small to very small riparian to subriparian sites, often consists of wet microsites within a much larger spruce–fir stand .....**22B. Spruce-Fir Riparian**

III. NON-RIPARIAN SITES BELOW THE ALPINE

29. Grasslands or forblands, not dominated by woody plants, woody plants only occasional-accidental or on minor microsites within a grassland site. Under protection from fire, sites with a grassland potential in the Great Plains may experience invasion by woody plants .....(30)
29. Sites dominated by woody plants (trees or shrubs) at potential .....(47)

IV. GRASSLANDS AND FORBLANDS

30. Grasslands primarily of the central Great Plains (but found elsewhere including in mountains), dominated by warm-season tall grasses: big and sand bluestems, prairie and giant sandreed, prairie and tall dropseeds, Indian grass, or porcupine grass; sometimes sand sagebrush is codominant .....(31)
30. Grasslands of the Great Plains or elsewhere, not dominated by the warm-season tall grasses listed above .....(3x)

31. Dominated by sand bluestem, prairie sandreed or giant sandreed, on dune sands .....(32)
31. Dominated by big and sand bluestems, prairie and tall dropseeds, Indian grass, or porcupine grass
..... **01B. Bluestem Prairie**

32. Codominated by sand sagebrush, on dunes and blowouts deposited by wind and water just south of major rivers .....**04A. Sand Sagebrush Prairie**
32. Sand sagebush absent or occasional, associated with major rivers or not .....(33)

33. Dominated by sand bluestem and prairie sandreed
.....**01A. Nebraska Sandhills**
33. Dominated by prairie sandreed or giant sandreed with various smaller grasses, outside the Sandhills of Nebraska .....**04B. Sandy Grassland**

34. Dominated at potential by short grasses, blue grama almost always dominant or codominant, buffalo grass often present, usually on "hard" sites (fine-textured, clayey, low-moisture sites) in the western Great Plains, often within the outer rain-shadow of the mountains to the west .....(35)
34. Dominated at potential by taller grasses, blue grama and buffalo grass only present at earlier seral stages.....(37)

35. Galleta present, often codominant with blue grama, usually on soils derived from limestone or limy sedimentaries; southeastern and southwestern Colorado
.....**03C. Grama-Galleta**
35. Galleta absent or occasional, never dominant. Soils from sedimentary formations or other; southeastern Colorado or elsewhere .....(36)

36. Dominated at potential by blue grama and buffalo grass, tightest soils of all, vegetation often sparse and matted .....**03B. Grama-Buffalograss**
36. Dominated at potential by blue grama with: western wheatgrass, threadleaf or needleleaf sedges, winterfat, needle-and-thread, or green needlegrass; loamy soils, potentially more productive
.....**03A. Grama-Needlegrass-Wheatgrass**

37. Dominated by dry-site grasses: needlegrasses, wheatgrasses, gramas, muhlys, fescues, bluegrasses, oatgrasses, threadleaf-needleleaf-sun sedges, dropseeds, bluestems, and pinegrasses .....(38)
37. Dominated by wet-site grasses: reed, reedgrass, cattails, tules, rushes, alkali grass, saltgrass, tufted hairgrass, bluejoint reedgrass, Nebraska sedge, short-beaked sedge, beaked-water-woolly sedges, or spike-rushes ....(16)

38. Plains grasslands, with green needlegrass, thickspike wheatgrass, sideoats grama, hairy grama, stonyhills muhly, or alkali sacaton dominant at potential. Communities dominated by western wheatgrass, needle-and-thread, or theadleaf- needleaf-sun sedges are clearly in the Great Plains climatic region. Communities dominated by little bluestem are in the Great Plains, Black Hills, or lowermost eastern foothills of the Rocky Mountains...(39)
38. Mountain and foothills grasslands and forblands, with Idaho-Arizona-rough-Thurber fescues, bluebunch wheat grass, muttongrass, mountain muhly, Parry and timber oatgrasses, osha, or purple pinegrass dominant. Communities dominated by western wheatgrass, needle-and-thread, or needleaf sedge are either clearly in a mountain climate or else codominated by one of the species listed in the previous sentence .....(41)

39. Dominated by little bluestem, sideoats grama, or stonyhills muhly, on plains or foothills
.....**02B. Bluestem-Grama Prairie**
39. Little bluestem, sideoats grama, and stonyhills muhly absent or occasional, never dominant .....(40)

40. Dominated by western wheatgrass, needle-and-thread, green needlegrass, needleleaf-threadleaf-sun sedges, or thickspike wheatgrass. Usually on fine- textured (but not "hard") soils in intermediate precipitation belt between the rain-shadow shortgrass prairie and the tallgrass prairie to the east. **02A. Wheatgrass-Needlegrass**
40. Dominated by alkali sacaton or tall dropseed, western wheatgrass often present or codominant. Usually on alluvial surfaces derived from sedimentary soils
.....**02C. Wheatgrass-Bluestem Prairie**

41. Dominated by bluebunch wheatgrass. Common in Northern Rockies and foothills and plains on the west side of the Northern Rockies, uncommon on the western slope of the Central Rockies .....(42)
41. Dominated by other grasses, bluebunch wheatgrass absent or occasional .....(44)

42. Codominated by bluebunch wheatgrass and Idaho fescue .....**08A. Fescue-Wheatgrass**
42. Idaho fescue absent or occasional .....(43)

43. Bluebunch wheatgrass codominant with Sandberg bluegrass. Western foothills and lower mountain slopes, often on sedimentaries or gypsum
.....**08B. Wheatgrass-Bluegrass**

43. Bluebunch wheatgrass codominant with other species: sideoats grama, blue grama, sedges, western wheatgrass, muttongrass, or needle-and-thread
..... **08C. Foothills Prairie**

44. Dominated by Parry oatgrass, Arizona fescue, mountain muhly, or slimstem muhly, usually in the montane zone (belt), in and around the Southern Rockies
.....**09C. Parry oatgrass, Arizona fescue, and muhly**
44. Dominated by Idaho fescue, rough fescue, Thurber fescue, purple pinegrass, timber oatgrass, needle-and-thread, or osha. Usually subalpine, but sometimes montane .....(45)

45. Dominated by Idaho fescue, Thurber fescue absent. Lower to middle subalpine (sometimes with rough fescue) in the Northern Rockies, upper subalpine in the Southern Rockies .....**09A. Rough and Idaho Fescue**
45. Dominated by Thurber fescue, osha, purple pinegrass, timber oatgrass, or needle-and-thread. Subalpine, Central & Southern Rockies .....(46)

46. Dominated at potential by Thurber fescue or osha. Throughout the subalpine in the central and southern Rocky Mountains on deep, brown, well- drained soils
.....**09B. Thurber Fescue**
46. Dominated by purple pinegrass, timber oatgrass, or needle-and-thread. Apparently restricted to the high subalpine in Colorado, on shallow, rocky, windswept sites .....**10. Colorado Subalpine Grassland**

47. Dominated at potential by trees, reproducing sufficiently to eventually form a canopy .....(48)
47. Dominated at potential by shrubs. Trees present are accidental or incidental, not reproducing sufficiently to form a canopy .....(84)

V. FORESTS

48. Dominated at potential by aspen, bur oak, or other deciduous trees .....(9)
48. Dominated at potential by coniferous trees .....(51)

49. Dominated at potential by bur oak or paper birch. Black Hills eastward and northward
.....**24C. Oak and Birch Forest**
49. Dominated at potential by aspen, with or without paper birch (only in the Black Hills). Throughout the mountains of the Region .....(50)

50. Potential aspen forests with understories of beaked hazel, Oregon-grape, or chokecherry. Black Hills and Pine Ridge eastward and northward, rarely in the lower foothills of the eastern slope of the Front Range
.....**23B. Canadian, Plains, and Black Hills Aspen**
50. Potential aspen forests of the Rocky Mountains, mostly in the Central and Southern Rockies
.....**23A. Rocky Mountain Aspen**

51. Dominated by smaller evergreen trees: piñon, Utah juniper, oneseed juniper, Rocky Mountain juniper, or curl-leaf mountain-mahogany .....(52)
51. Dominated by larger coniferous trees: ponderosa–lodgepole-bristlecone-limber-whitebark pines, blue-white-Engelmann spruces, white-subalpine-corkbark firs, or Douglas-fir .....(53)

52. Dominated by tall shrubs such as Gambel oak, serviceberry, mountain-mahogany, or chokecherry, without coniferous trees .....(84)
52. Dominated by piñon, Utah-oneseed-Rocky Mountain junipers, or curl-leaf mountain-mahogany .....(81)

VI. CONIFEROUS FORESTS

53. Forests of the pine ridges of the foothills, dominated by ponderosa pine, eastward of the Rocky Mountains and only on the fringes of the Black Hills. Usually Douglas-fir,spruce, or other conifer trees are not present even in adjacent stands; piedmont climate
.....19A. Eastern Ponderosa Forest
53. Forests of the Rocky Mountains and Black Hills, only rarely in the foothills or piedmont climates. Sometimes stand is dominated only by ponderosa pine, but other conifers (such as Douglas-fir or spruce) are usually present in adjacent stands .....(54)

54. Blue spruce or white fir are present and reproducing. Montane zone of the Southern Rockies .....(55)
54. Blue spruce and white fir absent or only accidental. Throughout the Region .....(59)

55. Blue spruce dominant in riparian sites, with other moisture-loving species such as cottonwood, dogwood, honeysuckle, willows, alder, or wet-site sedges. Usually a stream channel is present and forms the matrix of the site .....(25)
55. Non-riparian sites, with wet-site plant species absent or restricted to small microsites. If blue spruce is present, dryer-site trees such as Douglas- fir, white fir, or ponderosa pine are often present as well. Channels are small and restricted to small wetter microsites in a dryer matrix .....(56)

56. Blue spruce present and reproducing, often codominant with other trees such as aspen, white fir, Douglas-fir, or ponderosa pine **.....20F. Blue Spruce Uplands**
56. Blue spruce absent or accidental .....(57)

57. White fir present and reproducing, often codominant with other trees such as aspen, Douglas-fir, ponderosa pine, or southwestern white pine
.....20E. Southwestern White Fir
57. White fir absent or accidental .....(58)

58. Douglas-fir present and reproducing; often aspen, ponderosa pine, or southwestern white pine seral
.....20D. Colorado and Southwestern Douglas-Fir
58. Douglas-fir absent or accidental, not reproducing; ponderosa pine dominant at potential
.....20C. Colorado and Southwestern Ponderosa Pine

59. Dominated at potential by pines; more shade–tolerant trees absent or not reproducing (firs, Douglas-fir, spruces) .....(60)
59. Firs, Douglas-fir, or spruces present and reproducing; pines present or not .....(72)

60. Whitebark pine dominant in middle- to upper–subalpine forests of the Northern Rockies, in this Region in the Absaroka and Wind River Mountains only; ponderosa pine completely absent, even in adjacent stands .....(61)
60. Whitebark pine absent; throughout the Region ....(62)

61. Whitebark pine dominant, stands often open and trees sometimes gnarled; subalpine fir and spruce absent or accidental **.....21D. Whitebark Pine Forest**
61. Whitebark pine codominant with fir or spruce
.....22A. Western Spruce-Fir Forest
62. Bristlecone pine dominant in subalpine forests of the Southern Rockies, in this Region from middle Colorado on both sides of the Continental Divide into northern New Mexico; ponderosa pine absent, but may be occasional in adjacent stands .....(63)
62. Bristlecone pine absent; throughout the Region ...(64)

63. Bristlecone pine dominant, stands often open and trees sometimes gnarled; subalpine fir and Engelmann spruce absent or accidental..**21B. Bristlecone Pine Forest**
63. Bristlecone pine codominant with fir or spruce
.....22A. Western Spruce-Fir Forest

64. Ponderosa pine dominant in the montane zone (belt) of the Rocky Mountains and Black Hills; absent in the Absaroka and Wind River Mountains of northwest Wyoming and very rare in central-western and northwestern Colorado .....(65)
64. Ponderosa pine absent or accidental, not reproducing .....(69)

65. Ponderosa pine associated with greenleaf manzanita, western slope of the Uncompahgre Plateau in southwestern Colorado **.....20J. Ponderosa Shrub Forest**
65. Greenleaf manzanita absent .....(66)

66. More shade-tolerant trees (firs, Douglas-fir, spruces) present and reproducing with ponderosa pine .....(72)
66. More shade-tolerant trees absent from the stand or only accidental, not reproducing .....(67)

67. Ponderosa pine forests of the Black Hills of Wyoming-South Dakota and the Pine Ridge of northwestern Nebraska; often with chokecherry, western snowberry, bur oak, timber oatgrass, little bluestem, or sun sedge associated. Rarely also found in the lower montane along the eastern edge of the Front Range
.....19B. Black Hills Pine Forest
67. Ponderosa pine forests elsewhere besides the Black Hills or the Pine Ridge; never associated with chokecherry, timber oatgrass, little bluestem, bur oak, or sun sedge; western snowberry is associated only in the Northern Rockies .....(68)

68. Ponderosa pine forests of the Northern Rockies; often with species such as Idaho fescue, bluebunch wheatgrass, birch-leaf spiraea, western snowberry, or mallow ninebark associated. In this Region, Big Horn Mountains, Laramie Peaks, and a few stands in the Medicine Bow Mountains, Sierra Madre, and rarely in the northern Black Hills .....**20A. Northwestern Ponderosa Forest**
68. Ponderosa pine forests of the Central and Southern Rockies; often with species such as kinnikinnick, blue grama, mountain mahogany, Arizona fescue, spike-fescue, mountain muhly, Gambel oak, and elk sedge
.....20C. Colorado and Southwestern Ponderosa Pine

69. Dominated by limber pine on convex, rocky ridgetops and shoulders throughout the Rocky Mountains in the montane and subalpine, and on foothills ridges as well .....(70)
69. Limber pine absent or accidental .....(71)

70. Dominated by limber pine; more shade-tolerant trees (firs, Douglas-fir, spruces, lodgepole pine) absent or accidental, not reproducing .....**21A. Limber Pine Forest**
70. More shade-tolerant trees present and reproducing .....(72)

71. Dominated at potential by lodgepole pine in the upper montane and lower-middle subalpine throughout the Rocky Mountains. Absent in the Black Hills .....**21C. Lodgepole Pine Forest**
71. More shade-tolerant trees (firs, Douglas-fir, spruces) present and reproducing, lodgepole pine present or not .....(72)

72. Montane forests dominated by white fir, blue spruce, white spruce, or Douglas-fir. Subalpine fir, corkbark fir, or Englemann spruce absent or occasional individuals only, not reproducing .....(73)
72. Subalpine forests dominated by Engelmann spruce, subalpine fir, or corkbark fir .....(78)

73. White fir or blue spruce present and reproducing, Douglas-fir often also present .....(55)
73. White fir or blue spruce absent or occasional, not reproducing .....(74)

74. Dominated by white spruce in the Black Hills and Northern Rockies .....(75)
74. Dominated by Douglas-fir throughout the Rocky Mountains, absent from the Black Hills; often on north-facing slopes .....(77)

75. White spruce riparian forest, stream channel usually present, moist-site or wet-site sedge (softleaf-Peck sedges) associated.**20H. Engelmann and White Spruce Riparian**
75. White spruce upland forest, stream channels restricted to small wet microsites within a dryer matrix, dryer species such as common juniper, twinflower, heartleaf arnica, and mallow ninebark associated .....(76)

76. Subalpine fir present and reproducing in most stands of the type .....(78)
76. Subalpine fir absent or occasional only, never reproducing.....**20I. Engelmann and White Spruce Uplands**

77. Douglas-fir forests of the Northern Rockies; with associated species such as heartleaf arnica, pinegrass, curl-leaf mountain-mahogany, Idaho fescue, mallow ninebark, pachistima, birchleaf spiraea, snowberry, and huckleberry .....**20B. Douglas-Fir Forest**
77. Douglas-fir forests of the Central and Southern Rockies; with associated species such as kinnikinnick, Rocky Mountain maple, elk sedge, mountain-mahogany, Arizona fescue, jamesia, mountain ninebark, bitterbrush, and Gambel oak
.....**20D. Colorado and Southwestern Douglas-Fir**

78. Very open, patchy, krummholz, wind-shaped forests at the alpine-subalpine ecotone; extreme climate for trees; associated with grayleaf willows, whiproot clover, or other alpine-ecotone species
.....**22C. Spruce-Fir Krummholz**
78. Forests below the alpine-subalpine ecotone, or if at that ecotone then trees of normal form, in a more continuous canopy; sites protected from extreme wind ...(79)

79. Riparian spruce-fir forests, usually with a stream channel present; associated with wet-site species such as arrowleaf groundsel, mountain bluebells, bluejoint reedgrass, marsh-marigold, or horsetail
.....**22B. Spruce-Fir Riparian Forest**
79. Spruce-fir upland forests, stream channels only on small wetter microsites within a larger dryer matrix; wet-site species mentioned above absent or isolated individuals only .....(80)

80. Spruce-fir forests of the Northern and Central Rockies; associated with plant species such as elk sedge, Rocky Mountain maple, baneberry, heartleaf arnica, broadleaf arnica, pinegrass, Ross sedge, twinflower, Oregon-grape, pachistima, Wheeler bluegrass, currants, birchleaf spiraea, western meadow-rue, dwarf bilberry, huckleberry, or grouse whortleberry. Spruce nearly always present .....**22A. Western Spruce-Fir Forest**
80. Spruce-fir forests of the Southern Rockies; associated with plant species such as forest fleabane, thimbleberry, Fendler meadow-rue, Rocky Mountain whortleberry, or Thurber fescue; sometimes subalpine fir is dominant alone without spruce
.....**22D. Southwestern Spruce-Fir Forest**

VII. WOODLANDS

81. Dominated by tall or medium-height shrubs; curl-leaf mountain-mahogany, piñon, and tree junipers absent or isolated individuals only .....(84)
81. Short evergreen trees: piñon, or tree junipers; or curl-leaf mountain-mahogany present and dominant ..(82)

82. Curl-leaf mountain-mahogany in tree form dominant or codominant with piñon or a tree juniper. Western slopes of the Big Horn Mountains and Uncompahgre Plateau .....**13. Tall Evergreen Shrub Woodland**
82. Curl-leaf mountain-mahogany either absent, not in tree form, or else isolated individuals only. Stand dominated by piñon or tree junipers .....(83)

83. Dominated by Rocky Mountain juniper; piñon absent or isolated individuals only. Wooded draws of the Great Plains and foothills east of the Rocky Mountains and around the Black Hills
.....**12B. Juniper Steppe Woodland**
83. Dominated by piñon, oneseed juniper, or Utah juniper; if Rocky Mountain juniper is sometimes present, then piñon is always at least codominant
.....**12A. Juniper-Pinyon Woodland**

VIII. SHRUBLANDS

84. Riparian areas, with free unbound water or high water table through most of the growing season; dominated by shrub willows, Rocky Mountain maple, thinleaf alder, birches, redosier dogwood, bearberry honeysuckle, tufted hairgrass, wet-site sedges, bluejoint reedgrass, cattails, reed, horsetails, or marsh-marigold ..(8)
84. Upland sites, dominated by saltbushes, sagebrushes, oak, bitterbrush, serviceberries, mountain-mahogany, greasewood, chokecherry, snowberries, skunkbrush, shrubby cinquefoil, currants, raspberry, ocean-spray, shrub junipers, or squawbush; the wet-site species mentioned above are absent or restricted to minor wetter microsites in a larger dryer matrix .....(96)

85. Dominated by saltbushes, shadscale, sagebrushes, greasewood, or bitterbrush; serviceberry, mountain-mahogany, chokecherry, skunkbrush, and squawbush absent .....(90)
85. Dominated at potential by oak, serviceberries, mountain-mahogany, wax currant, chokecherry, snowberries, skunkbrush, or squawbush .....(86)

86. Dominated by mountain-mahogany (not curl-leaf), skunkbrush, or wax currant; oak and serviceberry usually not present
.....**16D. Mountain-Mahogany and Skunkbrush**
86. Dominated by oak, serviceberry, chokecherry, or snowberry; mountain-mahogany, skunkbrush, and wax currant present or not .....(87)

87. Saskatoon-Utah serviceberries or chokecherry present and dominant at potential; oak present, dominant, or absent .....**16B. Serviceberry and Chokecherry**
87. Serviceberry and chokecherry absent or occasional only at potential; take high palatability of these species to herbivores into account when assessing this; Gambel oak present, dominant, or absent .....(88)

88. Gambel oak present and dominant.**16A. Gambel Oak**
88. Snowberry dominant, usually no other shrubs present .....(89)

89. Snowberry (western or mountain) dominant, no other shrubs present .....**16C. Snowberry**
89. Snowberry codominant with other shrubs .....(84)

90. Alluvial terraces, benches, and bottoms with high to very-high salt content, often alkaline; water tables high at least seasonally or else soil poorly-drained; saltbushes, shadscale, or greasewood dominant .....(91)
90. Alluvial, colluvial, or residual landforms, salt content at most moderate, usually low to none; usually effectively well-drained; sagebrushes or bitterbrush dominant .....(92)

91. Very high salt content in soil, often highly alkaline as well; water table typically just below the surface in certain seasons, on bottoms and first terraces; greasewood dominant .....**14B. Greasewood**
91. High to moderately-high salt content; water table never close to the surface, on first to higher terraces; saltbush or scadscale dominant.**14A. Saltbush and Shadscale**

92. Low sagebrush (Artemisia arbuscula) present and dominant; usually other sagebrushes absent to isolated individuals. Deep, but effectively shallow, soils with montmorollinite clay content
.....**15A. Great Basin Low Sagebrush**
92. Low sagebrush absent or as isolated individuals only, sometimes including a hybrid zone with other sagebrushes (such as mountain big or silver) .....(93)

93. Alluvial terraces, bottoms, flats, or forest openings, with basin big or silver sagebrushes dominant .....(94)
93. Alluvial, colluvial, or residual landforms, with mountain big, Wyoming big, threetip, black, or longleaf sagebrushes dominant .....(95)

94. Basin big sagebrush dominant on alluvial terraces, often these terraces are now irrigated or dryland farm; warm to hot sites in valleys to the west of the mountains .....**15B. Basin Big Sagebrush**
94. Silver sagebrush dominant on alluvial flats or terraces, in forest openings on the lower western slopes of the mountains or in the Northern Great Plains; cool to cold sites .....**15E. Silver Sagebrush**

95. Black sagebrush dominant on harsh, very shallow, rocky, windswept sites; lower montane or foothills zones (belts); vegetation sparse even at potential
.....**15D. Black Sagebrush**
95. Black sagebrush absent or isolated individuals only; bitterbrush or big-threetip-longleaf sagebrushes dominant; soils deeper and sites less harsh; vegetation cover complete
..**15C. Mountain & Foothills Sagebrush & Bitterbrush**

96. Rocky cliffs or scree slopes with sparse vegetation, consisting of shrubby cinquefoil, ocean-spray, shrub junipers, currants, or raspberries .....(98)
96. Sites with more continuous, better-developed soils; other plant species dominant .....(97)

97. Shrubby cinquefoil dominant at present, on alluvial or colluvial landforms with high water tables or poorly-drained soils .....(8)
97. Shrubby cinquefoil absent .....(85)

98. Rocky cliffs or scree slopes with sparse vegetation in the mountains; vegetation consisting of ocean-spray, currants, common juniper, or raspberry
.....**18A. Mountain Rocks, Screes, and Cliffs**
98. Rocky cliffs or scree slopes with sparse vegetation in the plains, desert canyons, or foothills; vegetation consisting of creeping juniper or shrubby cinquefoil.....
18B. Plains, Desert, & Foothills Rocks, Screes, & Cliffs

APPENDIX 1. PLANT SPECIES NAMED IN THE KEY

COMMON NAME	CODE[b]	SCIENTIFIC NAME[a] (FAMILY)
alder, thinleaf	ALINT	*Alnus incana* ssp. *tenuifolia* (BET)
alkali grass	PUDI	*Puccinellia distans* (POA)
alkali sacaton	SPAI	*Sporobolus airoides* (POA)
arnica, broadleaf	ARLA8	*Arnica latifolia* (AST)
arnica, heartleaf	ARCO9	*Arnica cordifolia* (AST)
ash, green	FRPE	*Fraxinus pennsylvanica* (OLE)
aspen	POTR5	*Populus tremuloides* (SAL)
avens, alpine	ACROT	*Acomastylis rossii* ssp. *turbinata* (ROS)
baneberry	ACRU2	*Actaea rubra* (HEL)
bilberry, dwarf	VACE	*Vaccinium cespitosum* (ERI)
birch, bog	BEGL	*Betula glandulosa* (BET)
birch, paper	BEPA	*Betula papyrifera* (BET)
birch, river	BEFO2	*Betula fontinalis* (BET)
bitterbrush	PUTR2	*Purshia tridentata* (ROS)
bluebells, mountain	MECI3	*Mertensia ciliata* (BOR)
bluegrass, Sandberg	POSE	*Poa secunda* (POA)
bluegrass, Wheeler	PONE2	*Poa nervosa* (POA)
bluestem, big	ANGE	*Andropogon gerardii* (POA)
bluestem, little	SCSC	*Schizachyrium scoparium* (POA)
bluestem, sand	ANHA	*Andropogon hallii* (POA)
box-elder	NEAC	*Negundo aceroides* (ACE)
buffalo grass	BUDA	*Buchloe dactyloides* (POA)
cattails	TYPHA	*Typha* spp. (TYP)
chokecherry	PAVI11	*Padus virginiana* (ROS)
cinquefoil, shrubby	PEFL15	*Pentaphylloides floribunda* (ROS)
clover, Parry	TRPA5	*Trifolium parryi* (FAB)
clover, whiproot	TRDA2	*Trifolium dasyphyllum* (FAB)
cottonwood, Fremont	POFR2	*Populus fremontii* (SAL)
cottonwood, narrowleaf	POAN3	*Populus angustifolia* (SAL)
cottonwood, plains	PODEM	*Populus deltoides* ssp. *molinifera* (SAL)
currant, wax	RICE	*Ribes cereum* (GRS)
dogwood, redosier	SWSE	*Swida sericea* (COR)
Douglas-fir	PSME	*Pseudotsuga menziesii* (PIN)
dropseed, prairie	SPHE	*Sporobolus heterolepis* (POA)
dropseed, tall	SPAS	*Sporobolus asper* (POA)
dryas	DROC	*Dryas octopetala* (ROS)
elm, American	ULAM	*Ulmus americana* (ULM)
fescue, Arizona	FEAR2	*Festuca arizonica* (POA)
fescue, Idaho	FEID	*Festuca idahoensis* (POA)
fescue, rough	FECA4	*Festuca campestris* (POA)
fescue, Thurber	FETH	*Festuca thurberi* (POA)
fir, corkbark	ABBI2	"*Abies lasiocarpa* var. *arizonica*" (PIN)
fir, subalpine	ABBI2	*Abies bifolia* (PIN)
fir, white	ABCO	*Abies concolor* (PIN)
fleabane, forest	EREX4	*Erigeron eximius* (AST)
galleta	HIJA	*Hilaria jamesii* (POA)
grama, blue	CHGR15	*Chondrosum gracile* (POA)
grama, hairy	CHHI9	*Chondrosum hirsutum* (POA)
grama, sideoats	BOCU	*Bouteloua curtipendula* (POA)
greasewood	SAVE4	*Sarcobatus vermiculatus* (CHN)
groundsel, arrowleaf	SETR	*Senecio triangularis* (AST)
hairgrass, tufted	DECE	*Deschampsia cespitosa* (POA)
hazel, beaked	COCO6	*Corylus cornuta* (BET)
honeysuckle, bearberry	DIIN5	*Distegia involucrata* (CAP)
hop-hornbeam, eastern	OSVI	*Ostrya virginiana* (BET)
horsetail	EQUIS	*Equisetum* spp. (EQU)
huckleberry	VAGL	*Vaccinium globulare* (ERI)
Indian grass	SOAV2	*Sorghastrum avenaceum* (POA)
jamesia	JAAM	*Jamesia americana* (HDR)
juniper, common	JUCO6	*Juniperus communis* (CUP)
juniper, creeping	JUHO2	*Juniperus horizontalis* (CUP)
juniper, oneseed	JUMO	*Juniperus monosperma* (CUP)
juniper, Rocky Mtn.	JUSC2	*Juniperus scopulorum* (CUP)
juniper, Utah	JUOS	*Juniperus osteosperma* (CUP)
junipers, shrub		*J. communis* and *J. horizontalis* (CUP)
kinnikinnick	ARUV	*Arctostaphylos uva-ursi* (ERI)

kobresia	KOMY	*Kobresia myosuroides* (CYP)
manzanita, greenleaf	ARPA6	*Arctostaphylos patula* (ERI)
maple, Rocky Mountain	ACGL	*Acer glabrum* (ACE)
marsh-marigold	PSLE	*Psychrophila leptosepala* (RAN)
meadow-rue, Fendler	THFE	*Thalictrum fendleri* (COP)
meadow-rue, western	THOC	*Thalictrum occidentale* (COP)
mountain-mahogany	CEMO2	*Cercocarpus montanus* (ROS)
", curl-leaf	CELE3	*Cercocarpus ledifolius* (ROS)
muhly, mountain	MUMO	*Muhlenbergia montana* (POA)
muhly, slimstem	MUFI	*Muhlenbergia filiculmis* (POA)
muhly, stonyhills	MUCU3	*Muhlenbergia cuspidata* (POA)
muttongrass	POFE	*Poa fendleriana* (POA)
nailwort, alpine	PAPU2	*Paronychia pulvinata* (ASN)
needle-and-thread	STCO4	*Stipa comata* (POA)
needlegrass, green	STVI4	*Stipa viridula* (POA)
ninebark, mallow	PHMA5	*Physocarpus malvaceus* (ROS)
ninebark, mountain	PHMO4	*Physocarpus monogynus* (ROS)
oak, bur	QUMA2	*Quercus macrocarpa* (FAG)
oak, Gambel	QUGA	*Quercus gambelii* (FAG)
oatgrass, Parry	DAPA2	*Danthonia parryi* (POA)
oatgrass, timber	DAIN	*Danthonia intermedia* (POA)
ocean-spray	HODU	*Holodiscus dumosus* (ROS)
Oregon-grape	MARE11	*Mahonia repens* (BER)
osha	LIPO	*Ligusticum porteri* (API)
pachistima	PAMY	*Paxistima myrsinites* (CEL)
pine, bristlecone	PIAR	*Pinus aristata* (PIN)
pine, limber	PIFL2	*Pinus flexilis* (PIN)
pine, lodgepole	PICO	*Pinus contorta* (PIN)
pine, ponderosa	PIPO	*Pinus ponderosa* (PIN)
pine, southwest white	PIST3	*Pinus strobiformis* (PIN)
pine, whitebark	PIAL	*Pinus albicaulis* (PIN)
pinegrass	CARU	*Calamagrostis rubescens* (POA)
pinegrass, purple	CAPU	*Calamagrostis purpurascens* (POA)
piñon	PIED	*Pinus edulis* (PIN)
poplar, balsam	POBA2	*Populus balsamifera* (SAL)
porcupine grass	STSP2	*Stipa spartea* (POA)
raspberry	RUID	*Rubus idaeaus* (ROS)
reed	PHAU7	*Phragmites australis* (POA)
reedgrass, bluejoint	CACA4	*Calamagrostis canadensis* (POA)
rush	JUNCU	*Juncus* spp. (JUN)
sagebrush, basin big	ARTRT	*Artemisia tridentata* ssp. *tridentata* (AST)
sagebrush, black	ARNO4	*Artemisia nova* (AST)
sagebrush, longleaf	ARLO9	*Artemisia longiloba* (AST)
sagebrush, low	ARAR8	*Artemisia arbuscula* (AST)
sagebrush, mtn. big	ARTRV	*Artemisia tridentata* ssp. *vaseyana* (AST)
sagebrush, silver	ARCA13	*Artemisia cana* (AST)
sagebrush, threetip	ARTR4	*Artemisia tripartita* (AST)
sagebrush, Wyoming big	ARTRW8	*Artemisia tridentata* ssp. *wyomingensis* (AST)
saltbush	ATRIP	*Atriplex* ssp. (CHN)
saltgrass	DIST3	*Distichlis stricta* (POA)
sandreed, giant	CAGI3	*Calamovilfa gigantea* (POA)
sandreed, prairie	CALO	*Calamovilfa longifolia* (POA)
scadscale	ATRIP	*Atriplex* spp. (CHN)
sedge, beaked	CAUT	*Carex utriculata* (CYP)
sedge, elk	CAGE2	*Carex geyeri* (CYP)
sedge, Nebraska	CANE2	*Carex nebrascensis* (CYP)
sedge, needleleaf	CAFI	*Carex filifolia* (CYP)
sedge, Peck	CAPE11	*Carex peckii* (CYP)
sedge, Ross	CARO5	*Carex rossii* (CYP)
sedge, short-beaked	CASI2	*Carex simulata* (CYP)
sedge, softleaf	CADI6	*Carex disperma* (CYP)
sedge, sun	CAINH2	*Carex pensylvanica* ssp. *heliophila* (CYP)
sedge, threadleaf	CASTE	*Carex stenophylla* ssp. *eleocharis* (CYP)
sedge, water	CAAQ	*Carex aquatilis* (CYP)
sedge, woolly	CALA30	*Carex lanuginosa* (CYP)
sedges, wet-site		*C. aquatilis, C. lanuginosa, C. peckii, C. nebrascensis,* and *C. utriculata* (CYP)
seepweed	SUAED	*Suaeda* spp. (CHN)
serviceberry,Saskatoon	AMAL2	*Amelanchier alnifolia* (ROS)
serviceberry, Utah	AMUT	*Amelanchier utahensis* (ROS)

skunkbrush	RHTRT	*Rhus aromatica* ssp. *trilobata* (ANA)
snowberry, western	SYOC	*Symphoricarpos occidentalis* (CAP)
spike-fescue	LEKI	*Leucopoa kingii* (POA)
spike-rush	ELEOC	*Eleocharis* ssp. (CYP)
spiraea, birch-leaf	SPBE2	*Spiraea betulifolia* (ROS)
spruce, blue	PIPU	*Picea pungens* (PIN)
spruce, Engelmann	PIEN	*Picea engelmannii* (PIN)
spruce, white	PIGL	*Picea glauca* (PIN)
squawbush	PERA4	*Peraphyllum ramosissimum* (ROS)
thimbleberry	RUPA18	*Rubacer parviflora* (ROS)
tule	SCIRP	*Scirpus* spp. (CYP)
twinflower	LIBO3	*Linnaea borealis* (CAP)
wheatgrass, bluebunch	PSSP	*Pseudoroegneria spicata* (POA)
wheatgrass, thickspike	ELDA	*Elytrigia dasystachya* (POA)
wheatgrass, western	PASM	*Pascopyrum smithii* (POA)
whortleberry, grouse	VASC	*Vaccinium scoparium* (ERI)
whortleb., Rocky Mtn.	VAMYO	*Vaccinium myrtillus* ssp. *oreophilum* (ERI)
willow, Bebb	SABE2	*Salix bebbiana* (SAL)
willow, Booth	SABO2	*Salix boothii* (SAL)
willow, coyote	SAEX	*Salix exigua* (SAL)
willow, Drummond	SADR	*Salix drummondii* (SAL)
willow, Geyer	SAGE2	*Salix geyeri* (SAL)
willow, grayleaf	SAGL	*Salix glauca* (SAL)
willow, hoary	SACA4	*Salix candida* (SAL)
willow, meadow	SAPE5	*Salix gracilis* (SAL)
willow, peachleaf	SAAM2	*Salix amygdaloides* (SAL)
willow, planeleaf	SAPL2	*Salix planifolia* (SAL)
willow, sandbar	SAEX	*Salix exigua* (SAL)
willow, Wolf	SAWO	*Salix wolfii* (SAL)
willow, yellow	SALU2	*Salix lutea* (SAL)
willows, forb		*S. arctica* & *S. reticulata* ssp. *nivalis* (SAL)
winterfat	KRLA2	*Kraschennenikovia lanata* (CHN)

a. Plant species name as used in Region 2.
b. National standard plant symbol, from data base PLANTS (NRCS 1992).

APPENDIX 2. SUMMARY OF HIERARCHY

PLANT GROUPS[a] are represented by Roman Numerals, names in CAPS
PLANT FORMATIONS[a] are represented by Arabic Numerals
PLANT SUBFORMATIONS[a] are represented by Capital Letters

I. PLAINS GRASSLAND

- 01. Tallgrass Prairie
  - A. Nebraska Sandhills
  - B. Bluestem Prairie
- 02. Northern Mixed-grass (Midgrass) Prairie
  - A. Wheatgrass-Needlegrass
  - B. Bluestem-Grama Prairie
  - C. Wheatgrass-Bluestem Prairie
- 03. Shortgrass Prairie
  - A. Grama-Needlegrass-Wheatgrass
  - B. Grama-Buffalograss
  - C. Grama-Galleta
- 04. Sandy Prairie
  - A. Sand Sagebrush Prairie
  - B. Sandy Grassland

II. PLAINS RIPARIAN, FLOODPLAINS, & OTHER WATER-DOMINATED COMMUNITIES

- 05. Fresh-Water Riparian Grasslands
- 06. Salt Flats
- 07. Plains Deciduous Woody Riparian
  - A. Plains Cottonwood
  - B. Ash-Elm-Maple-Hophornbeam Bottoms
  - C. Tree Willows
    [Oak and Birch, see 24]

III. FOOTHILL AND MOUNTAIN GRASSLANDS

- 08. Palouse Prairie
  - A. Fescue-Wheatgrass
  - B. Wheatgrass-Bluegrass
  - C. Foothills Prairie
- 09. Fescue Mountain and Foothill Grasslands
  - A. Rough and Idaho Fescue
  - B. Thurber Fescue
  - C. Parry Oatgrass, Arizona Fescue, and Muhly
- 10. Colorado Subalpine Grassland
- 11. Mountain Riparian Grassland
  - A. Tufted Hairgrass and Reedgrass Wet Meadows
  - B. Sedge Wetlands

IV. WOODLAND

- 12. Coniferous Woodland
  - A. Juniper-Pinyon Woodland
  - B. Juniper Steppe Woodland
- 13. Tall Evergreen Shrub Woodland

V. COLD DESERT SHRUBLANDS

- 14. Desert Alluvial Salt Shrub
  - A. Saltbush and Shadscale
  - B. Greasewood
- 15. Sagebrush
  - A. Great Basin Low Sagebrush
  - B. Basin Big Sagebrush
  - C. Mountain and Foothills Sagebrush and Bitterbrush
  - D. Black Sagebrush
  - E. Silver Sagebrush

VI. MOUNTAIN AND FOOTHILLS MIXED SHRUBLAND

16. Deciduous Green Shrubland
    - A. Gambel Oak
    - B. Serviceberry and Chokecherry
    - C. Snowberry
    - D. Mountain-Mahogany and Skunkbrush
17. Mountain Riparian Shrub
    - A. Foothills and Plains Riparian Shrub
    - B. Montane Alder Riparian
    - C. Montane Maple-Dogwood-Honeysuckle Riparian
    - D. Montane Willow Riparian
    - E. Subalpine Birch Riparian
    - F. Subalpine Willow Riparian
18. Rocky Slopes, Screes, and Cliffs
    - A. Mountain Rocks, Screes, and Cliffs
    - B. Plains, Desert, and Foothills Rocks, Screes, and Cliffs

VII. MOUNTAIN CONIFEROUS FORESTS (ROCKY MOUNTAIN)

19. Foothills and Plains Coniferous Forests
    - A. Eastern Ponderosa Forest
    - B. Black Hills Pine Forest
20. Montane Coniferous Forest
    - A. Northwestern Ponderosa Forest
    - B. Douglas-fir Forest
    - C. Colorado and Southwestern Ponderosa Pine
    - D. Colorado and Southwestern Douglas-fir
    - E. Southwestern White Fir
    - F. Blue Spruce Uplands
    - G. Blue Spruce Riparian
    - H. Engelmann and White Spruce Riparian
    - I. Engelmann and White Spruce Uplands
    - J. Ponderosa Shrub Forest
21. Montane and Subalpine Pine Forests
    - A. Limber Pine Forest
    - B. Bristlecone Pine Forest
    - C. Lodgepole Pine Forest
    - D. Whitebark Pine Forest
22. Subalpine Forest
    - A. Western Spruce-Fir Forest
    - B. Spruce-Fir Riparian
    - C. Spruce-Fir Krummholz
    - D. Southwestern Spruce-Fir Forest

VIII. MOUNTAIN AND FOOTHILLS DECIDUOUS FORESTS

23. Aspen
    - A. Rocky Mountain Aspen
    - B. Canadian, Plains, and Black Hills Aspen
24. Mountain and Foothills Deciduous Riparian Forests
    - A. Narrowleaf Cottonwood Riparian
    - B. Canyon Cottonwood-Box-Elder Riparian
    - C. Oak and Birch Forest

IX. ALPINE GRASSLANDS AND FORBLANDS

25. Alpine Grasslands
26. Alpine Uplands, Windscars, & Early Snowmelt Areas
    - A. Mats
    - B. Fellfields and Ridges
    - C. Ridges and Protected Sites With Coarse Soils
27. Bog-Marsh Forblands and Late Snowmelt Areas

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a. Johnston, Barry C. 1987. Plant Associations of Region Two, Edition 4. Publication R2-ECOL-87-2, 429 pp. Lakewood, CO: USDA Forest Service, Rocky Mountain Region. After Driscoll, R. S., D. L. Merkel, D. L. Radloff, D. E. Snyder, and J. S. Hagihara. 1984. An Ecological Land Classification Framework for the United States. Miscellaneous Publication 1439, 56 pp. Washington, DC: U. S. Department of Agriculture, Forest Service.